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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/299,874	04/27/1999	SEIJI HASHIMOTO	862.2798	3802

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EXAMINER

TRAN, NHAN T

ART UNIT PAPER NUMBER

2615

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/299,874

Applicant(s)

HASHIMOTO ET AL.

Examiner

Nhan T. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 and 83 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 8, 10-18 and 83 is/are rejected.
- 7) ☒ Claim(s) 6, 9 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-5, 7, 8, 10-18 & 83 have been considered but are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-5, 7, 8, 17 & 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Guidash (US 6,160,281).

Regarding claim 1, Guidash discloses an image sensing apparatus having a plurality of unit cells (Figs. 4A & B or 7 & 8) arranged in two dimensions (Figs. 5A & B or Fig. 9), each unit cell including a plurality of photoelectric conversion elements (two pixels 31 for each unit cell) and a common circuit (i.e., an amplifier, floating diffusion, row select transistor, etc...See abstract) shared by and arranged between said plurality of photoelectric conversion elements

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included in the same unit cell that the common circuit belongs to, wherein said common circuit includes at least a transistor (i.e., an amplifier or a row select transistor), signals from said plurality of photoelectric conversion elements are coupled to the transistor and processed. and the transistor outputs the processed signals to an output line (see col. 2, lines 14-20, 58-65 and col. 4, line 57 – col. 5, line 35, and note that the amplifier is also a transistor since it's a source follower transistor in such an Active Pixel Sensor).

Guidash further discloses, *in Figs. 5A, 5B, 9 and col. 4, line 18 – col. 5, line 35*, a set of two pixels are mirrored from the abutting set of other two pixels and that all pixel structures have substantially same dimension. It is clearly seen from Guidash's disclosure, a first distance between a center of mass of photo-receiving areas (31) of adjoining photoelectric conversion elements included in a given unit cell (one set of two pixels 31) is **substantially** equal to a second distance between the center of mass of the photo-receiving areas of the adjoining photoelectric conversion elements included in different unit cells (another set of two pixels 31), and a third distance between a center of mass of the photo-receiving area of a photoelectric conversion element included in the given unit cell and the center of mass of the photo-receiving area of the adjoining photoelectric conversion element included in an adjoining unit cell.

It is noted that since each set of two pixels are mirrored each other as disclosed, a distance between the center of mass of two pixels in x direction is **substantially** equal to a distance between the center of mass of another two pixels in either x or y direction as shown in Figs. 5A, 5B and 9.

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Regarding claim 2, Guidash further discloses that the plurality of photoelectric conversion elements (31) in each unit cell are arranged side by side in one direction (either in row direction as shown in Figs. 4A & B or column direction as shown in Figs. 7 & 8), and said common circuit is arranged at the edge of each plurality of photoelectric conversion elements.

Regarding claim 3, also shown in Figs. 5A, B or 9, the plurality of photoelectric conversion elements (31) in each unit cell are arranged side by side in one direction, and said common circuit is arranged between adjoining unit cells arranged in a direction perpendicular to the direction of the arrangement of said plurality of photoelectric conversion elements.

Regarding claims 4 & 7, as shown in Figs. 4-9, the common circuit is arranged at the edge of each plurality of photoelectric conversion elements (31) arranged in a horizontal and vertical directions.

Regarding claims 5 & 8, since each set of two pixels are mirrored and has same structure and dimension, a number of horizontal and vertical conductors passing over each pixel is the same as shown in Figs. 4-9 and col. 4, line 18 – col. 5, line 35.

Regarding claim 17, it is clearly disclosed that the common circuit is an amplifier for amplifying and outputting signal from each of the plurality of photoelectric conversion element. See abstract and col. 3, lines 45-49 and col. 4, lines 58-67.

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Regarding claim 18, Guidash also discloses that the common circuit includes transfer means for transferring the signal from each of the plurality of photoelectric conversion element and reset means for resetting the common circuit. See abstract and col. 3, lines 45-49 and col. 4, line 58 – col. 5, line 10.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guidash (US 6,160,281) in view of Takahashi (US 5,955,753).

Regarding claim 10, Guidash teaches that noise reading means for reading noise of the common circuit (see col. 4, line 65 – col. 5, line 10, wherein reset noises of a pixel in row A and a pixel in row B are read out before the image signal levels are read out);

first signal reading means for reading a first signal (image signal level of the pixel in row A) through the common circuit, and second signal reading means for reading a second signal (image signal level of the pixel in row B) through the common circuit (see col. 4, line 65 – col. 5, line 10).

Guidash is just silent about noise reduction means for reducing the noise from the first and second signals. However, as taught by Takahashi in **Fig. 1**, reset noises are read out and stored in capacitor 10, and a noise reduction means (differential amplifier 14) reduces the noises contained in the image signals read out from the pixels. See Takahashi, col. 4, line 48 – col. 5, line 9.

Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Guidash and Takahashi to implement a noise reduction means for reducing noises contained in image signals so as to enhance image quality.

Regarding claim 11, as clearly seen from Takahashi in Fig. 1; col. 4, line 48 – col. 5, line 9, the noise reduction means is a differential amplifier (14).

Regarding claim 12, both Guidash and Takahashi show that the first signal is read from one of the plurality of photoelectric conversion elements in each unit cell, and the second signal is read from another photoelectric conversion element in the same unit cell (see Guidash col. 4, line 57 – col. 5, line 10 and Takahashi, col. 5, lines 2-9).

Regarding claim 13, Takahashi further discloses that the first signal is read from one of the plurality of photoelectric conversion elements (in case of non-adding mode) in each unit cell, and second signal is read from a photoelectric conversion element and another photoelectric conversion element in the same unit cell (in case of adding mode). See Takahashi, col. 5, lines 55-67.

Regarding claims 14-16, see the analyses of claims 10-12, respectively.

4. Claim 83 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guidash (US 6,160,281).

Regarding claim 83, Guidash teaches a signal processing unit (i.e., an amplifier) that processes a signal outputted from the unit cells as analyzed in claim 1 above.

Guidash does not explicitly disclose a lens unit projects incoming light onto unit cells and a control circuit that controls overall operation of the image sensing apparatus. However, an Official Notice is taken that it is notoriously well known in the art for an Active Pixel Sensor (APS) to be implemented in an imaging apparatus such as an electronic or digital camera which includes a lens unit that projects incoming light onto pixels and a control circuit that controls overall operation of the imaging sensing apparatus for a user to take images.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a complete imaging apparatus, i.e., an electronic or digital camera, that would include the active pixel sensor taught by Guidash and lens unit to project incoming light onto the unit cells and a control circuit that would control overall operation of the imaging sensing apparatus for taking images electronically.

Allowable Subject Matter

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5. Claims 6, 9 & 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 6 & 9, the prior art of record fails to teach or fairly suggest that *contacts between layers of each pixel are arranged so that a number of conductors passing over each unit cell, as well as one of the contacts which is not connected to a conductor passing over the unit cell is connected to a light-shield film of the pixel.*

Regarding claim 19, the prior art of record also fails to teach or fairly suggest that *the common circuit is digital signal conversion means for converting a signal from each of the plurality of photoelectric conversion element into a digital signal.*

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhan T. Tran whose telephone number is (571) 272-7371. The examiner can normally be reached on Monday - Thursday, 8:00am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Groody can be reached on (571) 272-7950. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NT.


James J. Groody
Supervisory Patent Examiner
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